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NOTES ON THE LIFE HISTORY OF EUREMA LISA (BOISDUVAL AND LECONTE).

BY ARETAS A. SAUNDERS.

The notes on which this paper is based were made nineteen years ago. I have withheld them from publication mainly because of the fact that when they were made I was but a boy in high school, knowing nothing of how such things might be published. Since then my interests have been ornithological rather then entomological, and the notes have lain almost forgotten among a stack of other papers. Having recently unearthed them, and being convinced of their accuracy and importance, I venture to submit them.

Discussing the life history of the Little Sulphur Butterfly (*Eurema lisa*) Scudder, after giving his experiences in raising it, says:[1] "It scarcely seems possible that the earliest produce of the second brood can reach maturity in season out-of-doors to give birth to butterflies before such cold frosty nights would come as would kill the newly emerged butterflies. Still it would appear that it is probably by this small chance of life that this butterfly maintains its foothold in the warmer nooks of New England." That this probability is fact, and that the chances are greater than Scudder supposed, are the points which I believe my notes reveal.

On August 10, 1900, at New Haven, Conn., I followed a female Little Sulphur as it laid its eggs, and secured eight of the latter. They had been laid on leaves of the Partridge Pea (*Cassia Chamaecrista*). I uprooted a small plant, with one of the eggs on it, took it home and potted it, that my caterpillars might have fresh food. I placed the plant and eggs on the sill of an open window, where they might have conditions as much like out-of-doors as possible, and proceeded to watch them and

[1] Everyday Butterflies, pp. 349–350.

keep notes. I did not use a breeding cage, but left the plant entirely open, trusting that my caterpillars would not leave the food plant. Five of the eight were lost when so small that it was difficult to follow their movements, but the other three grew to maturity, passed through all stages and became butterflies.

The eggs hatched August 13, three days from the time they were laid. The caterpillars hung for the chrysalis August 28 and 29, and the chrysalids were formed August 29 and 30, after fifteen to sixteen days in the caterpillar stage. The chrysalids showed first change of color on September 2 and 3, and the butterflies emerged September 4 and 5, after only seven days in the chrysalis. These periods are all remarkably shorter than those given by Scudder who gives for the egg, six days; for the caterpillar, one month; and for the chrysalis, thirty to thirty-eight days.

The conditions under which the caterpillars grew were, I believe, very nearly natural ones. The caterpillars were kept on the sill of an open, though screened window, on the south side of the house, where they obtained sunshine during the greater part of the day. When the chrysalids were formed I moved them, and fastened them to the wall of the room a few feet from the open window. There was no artificial heat in the room, and none in the house except a kitchen stove on the floor below, and on the opposite side of the house. The weather, during the time of the egg stage, was unusually hot. I have no notes or memory on weather conditions during the rest of the time.

At the time my butterflies emerged from their chrysalids, butterflies of this species were still flying out-of-doors, and caterpillars only a few days old were easily found. I believe that the earlier butterflies of the second brood to appear, can and do produce a third brood, which comes early in September; that this brood appears while the second brood is still flying; and that it is through these earlier butterflies that the species is able to exist in southern New England. The differences in the time occupied by the early stages, shown when Scudder's observations are compared with mine, is simply due to weather conditions. Those insects that pass through the early stages in mid-August encounter decidedly warm weather, while those that wait until late August and September meet colder conditions and develop more slowly.